

FY05-LII(52)-136

“Center for Air Toxic Metals Affiliates Program”

Contractor: Energy & Environmental Research Center

Principal Investigator: John Pavlish

PARTICIPANTS

<u>Sponsor</u>	<u>Cost Share</u>
EPA	\$ 3,000,000
Basin Electric Power Cooperative	\$ 45,000
Ottetail Power Company	\$ 45,000
Tennessee Valley Authority	\$ 45,000
Mitsui Babcock	\$ 18,000
NDIC	<u>\$ 45,000</u>
Total Cost	\$ 3,090,000

Project Schedule - 36 Months

Contract Date – June 7-2005

Start Date – June 14, 2005

Completion Date – December, 2007

Project Deliverables

Contract Signed: ✓

Annual Reports:

2004 Annual Report 12/31/04 (✓);

2005 Annual Report 12/31/05 (✓);

2006 Annual Report 12/31/06 ();

Final Report 12/31/07 ()

OBJECTIVE / STATEMENT OF WORK:

To further the understanding of the behavior of potential toxic metals in coal-fired utilities, other fossil fuel systems, waste-to-energy systems and waste incinerators. A specific objective of the CATM program is the study of the fate and control of mercury emissions from coal-fired systems. This project is a continuation of Project FY95-XX-62, FY99-XXXII-89 and FY02-XLIV-111.

STATUS

Year 2004 Highlights.

- Unburned carbon was evaluated for mercury capture.
- Basic studies of heterogeneous & homogeneous transformations are providing insights on impacts of flue gas components on mercury, with sulfur demonstrating a dominant role.
- Bench-scale tests are continuing to evaluate & aid in the development of Hg sorbents.
- A model to explain the interactions between flue gas constituents & activated carbon has been further refined.
- Bench-scale test have been initiated to identify & evaluate SCR catalysts that would promote mercury oxidation.

- Studies on interactions between dietary mercury & selenium seem to underscore the importance of diets that are rich in selenium as a means of offsetting the effects that occur with ingestion of mercury.

Year 2005 Highlights

- Studies to convert elemental mercury to the oxidized form in order to promote capture
- Continued to evaluate unburned carbon for its benefits as a mercury sorbent
- Continued to evaluate improved methods for evaluating the effects of halogens on the conversion of elemental mercury to inorganic and organic compounds with coal combustion flue gas
- Development of a laser-based method for measuring elemental mercury
- Methods to improve measurement of mercury and chlorine in combustion flue gases
- Evaluation of mercury-selenium interactions in aquatic ecosystems
- Evaluation of the stability of mercury and air toxic elements associated with coal combustion byproduct management